Oroville Facilities Relicensing

Operations Modeling Update

February 20, 2003

- **Statewide Modeling (CALSIM II)**
  - **Monthly time step planning model**
  - **Status of development:**
    - ✓ Currently reviewing existing conditions assumptions that have been developed by DWR.
    - ✓ Collecting future conditions benchmark studies.
  - **Schedule:** The model is complete and ready to use. We are prepared to use existing benchmark studies for the existing conditions analysis, but will update the analysis as needed. Our plan is to "lock" the existing conditions study as of the end of February '03. Currently, we are assessing the local depletions data as well as the Yuba River hydrology.
  - **Uses for model output**
    - ✓ Base condition scenarios to be compared to proposed alternatives.
    - ✓ Develop target conditions for finer resolution modeling efforts (such as with Local Ops model and Water temperature model).
  - **Examples of use include:**
    - ✓ Water supply impacts.
    - ✓ Lake Oroville storage/elevation conditions and changes.
    - ✓ Cumulative impact analysis to statewide systems.

- **Local Operations Modeling**
  - **Daily/hourly time step**
  - **Status of development:** Powell Technologies has begun developing the local operations model using HYDROPS. Modelers are starting to process Oroville operational data provided by the Department.
  - **Schedule:** Completion date has slipped to the end of April, but we don't anticipate this slippage will impact model analyses.
  - **Uses for model output:** Compare alternatives to base condition scenarios.
    - ✓ Thermalito Complex storage/elevation conditions and changes
    - ✓ Effects on Power generation.
    - ✓ Reservoir and river release conditions as input for temperature modeling.
    - ✓ Analyses of operational scenarios.

- **Temperature Modeling**
  - **Daily/hourly time step**
  - **Status of Development:** Major work has been completed on the two of the three primary components.
    - ✓ The model component that simulates Lake Oroville has been developed and is currently being calibrated. Initial calibration runs show the model results match very well with actual data for the period June-August 2002. The model has been developed as a one-dimensional model.
    - ✓ The model component for the diversion pool, forebay and afterbay has also been completed. Calibration runs are being performed for the period June-August 2002. The original plan was to model the afterbay and forebay as stratified bodies, given their large surface area. After examination of the data, it was found the afterbay and forebay were not as stratified as the diversion pool. While not initially intuitive, it appears the long deep channel remains stratified as a result of Hyatt operations. The forebay is only weakly stratified (when compared to the diversion pool); this may be attributed to the fact that water is extracted from the warmer layers of the diversion pool. Weak stratification of the afterbay may be occurring for similar reasons.

    Next steps are to complete the Thermalito Complex model development and begin work on the Feather River temperature component. Work on the river component will take close coordination with the Environmental Workgroup to identify locations along the river that simulated data are needed.

  - **Schedule:** Complete development by end of June '03.
  - **Uses for model output:** Compare alternatives to base condition scenarios.
    - ✓ Temperature conditions and changes at specified locations along the river.
    - ✓ Temperature of diversions from afterbay.
    - ✓ Temperature of releases to the Feather River.

- **Stage/Flow Modeling**
  - **Hourly time step**
  - **Status of Development:**
    - ✓ Completed review of alternatives.
    - ✓ DWR reviewed recommendations by Modeling Consultants and completed a task order to implement HECRAS.
  - **Schedule:** The model would be completed by end of March '03 and work is ahead of schedule.
  - **Uses of model output:**
    - ✓ Compare alternatives to base condition scenarios.
    - ✓ Provide hydrodynamic conditions for temperature modeling and scour modeling.